AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A method for performing an orthogonal code hopping multiplexing communication in a band spreading communications system using an orthogonal code, the method comprising:

performing a statistical multiplexing for communication channels from a first communication station to second communication stations ~~by an orthogonal code hopping multiplexing communication~~.

2. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 1,

wherein the communication channels from the first communication station to [[a]] ~~plurality of~~ the second communication stations are synchronized to distinguish the communication channels by using orthogonality.

3. (Previously Presented) The method of claim 1, further comprising:

distinguishing the communication channels from the first communication station to the second communication stations with use of orthogonal code hopping patterns.

4. (Previously Presented) The method of claim 2, further comprising:

distinguishing the communication channels from the first communication station to the second communication stations with use of orthogonal code hopping patterns.

5. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 1,

wherein the orthogonal code ~~is~~ comprises a Hadamard code.

6. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 1,

wherein the orthogonal code ~~is~~ comprises a variable spreading factor code.

7. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 1,

wherein the orthogonal code ~~is~~ comprises a gold code.

8. (Previously Presented) The method of claim 3, further comprising:

allocating the orthogonal code hopping pattern to the second communication stations.

9. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 3,

wherein the orthogonal code hopping ~~pattern is~~ patterns are allocated to the second communication stations from the first communication station when starting communication, and the second communication stations ~~give back~~ return the orthogonal code hopping ~~pattern~~ patterns when the communication is completed.

10. (Currently Amended) The method of claim 3, further comprising:

performing the orthogonal code hopping multiplexing for a channel from among the communication channels having a low transmission data activity.

11. (Currently Amended) The method of claim 3, further comprising:

transmitting a command for controlling transmission power of each of the second communication ~~station with use of~~ stations using a separate common power control channel of the first communication station.

12. (Previously Presented) The method of claim 11,

wherein the transmission power control command of each second communication station in the common power control channel is time-multiplexed and employs a collision-resistant hopping pattern for preventing collision of the hopping pattern.

13. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 12,

wherein the collision-resistant hopping pattern ~~includes~~ comprises a fixed orthogonal code symbol allocation ~~like a code division multiplexing~~.

14. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 3,

wherein the orthogonal code hopping patterns for the statistical multiplexing are generated ~~with use of a pseudo-noise sequence generator~~ at random.

15. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 14,

wherein the random code hopping patterns are generated ~~with use of~~ using a pseudo-noise sequence generator.

16. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 3,

wherein a plurality of the orthogonal code hopping patterns for the statistical multiplexing are allocable to one of the second communication stations according to a send data rate of the first communication station.

17. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 16,

wherein each of the orthogonal code hopping patterns hops independently in the orthogonal code hopping multiplexing communications.

18. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 16,

wherein the orthogonal code hopping patterns hop ~~not to generate collision each other~~ to avoid collisions in the orthogonal code hopping multiplexing communications.

19. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 3,

wherein the orthogonal code hopping patterns are periodically repeated in a frame unit.

20. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 19,

wherein the frame unit ~~is~~ comprises an independent data unit based on channel encoding.

21. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 14,

wherein the first communication station detects a hopping pattern collision caused by the random orthogonal code hopping patterns in advance ~~in order not to transmit~~ to avoid transmitting a corresponding dispreading data symbol.

22. (Previously Presented) The method of claim 14, further comprising:

comparing despreading data symbols at a time of a hopping pattern collision caused by the random orthogonal code hopping patterns in order to transmit the data symbols when all of the data symbols are the same.

23. (Previously Presented) The method of claim 14, further comprising:

comparing despreading data symbols at a time of a hopping pattern collision caused by the random orthogonal code hopping patterns in order to not transmit the data symbols when the data symbols are not the same.

24. (Previously Presented) The method of claim 23, further comprising:

increasing a transmission power of a data symbol next to the data symbols, which are not transmitted because of discordance of the despreading data symbols at a time of the hopping pattern collision.

25. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 24,

wherein the transmission power is increased ~~as much as an amount given by~~ in accordance with a first system parameter during a period ~~given by~~ provided in accordance with a second system parameter.

26. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 25,

wherein the ~~two system parameters are~~ first system parameter and the second system parameter comprise position functions of the not-transmitted dispreading data symbols.

27. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 26,

wherein the ~~two system parameters are~~ first system parameter and the second system parameter are at least 0.

28. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 21,

wherein the hopping pattern collision is ~~prevented only~~ detected when there is a possibility that sending antenna beams of the first communication station~~, where the hopping patterns are collided,~~ are superposed so to cause ~~a serious~~ an error in a channel decoding process of at least one of the second communication ~~station~~ stations.

29. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 28,

wherein a pilot signal is used for initial synchronous gain and tracking of the channels and synchronous decoding of the channels owing to phase distortion compensation.

30. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 29,

wherein the pilot system employs a non-collision hopping pattern for preventing a loss of the phase distortion compensation ~~ability~~ due to collision.

31. (Currently Amended) The method ~~for orthogonal code hopping multiplexing communications as claimed in~~ of claim 30,

wherein the non-collision hopping pattern ~~includes~~ comprises a fixed orthogonal code symbol allocation ~~like the code division multiplexing~~.

32. (Currently Amended) A transmitter in a band spreading communications system including a first communication station and ~~a~~ at least one second communication station, the transmitter comprising:

a channel encoder for coding a channel;

an orthogonal code hopping pattern generator for generating an orthogonal code hopping pattern;

an orthogonal code generator for generating an orthogonal code symbol according to the hopping pattern; and

an orthogonal code collision detector for detecting a collision ~~of~~ involving the hopping ~~patterns~~ pattern.

33. (Currently Amended) The transmitter ~~as claimed in~~ of claim 32, further comprising:

an interrupter for interrupting a send signal according to an output of the orthogonal code collision detector.

34. (Currently Amended) The transmitter ~~as claimed in~~ of claim 33,

wherein the orthogonal code collision detector ~~includes~~ comprises a despreading data symbol comparator for ~~comparing that all of~~ determining whether despreading data symbols of corresponding channels are the same at a time of a hopping pattern collision; and

wherein the interrupter interrupts ~~transmission of~~ the ~~sending~~ send signal ~~in case that~~ when the dispreading data symbol comparator determines that the corresponding despreading data symbols are not the same ~~as a comparison result of the dispreading data symbol separator~~.

35. (Currently Amended) A receiver in a band spreading communications system including a first communication station and at least one second communication ~~stations~~ station, the receiver comprising:

a channel decoder for coding a channel;

an orthogonal code hopping pattern generator for generating an orthogonal code hopping pattern; and

an orthogonal code generator for generating an orthogonal code symbol according to the hopping pattern.

36. (Currently Amended) A method for band spreading communications in a band spreading communications system using orthogonal codes, the method comprising:

dividing the orthogonal codes into a first orthogonal code symbol group for code division multiplexing; and[;]

dividing the orthogonal codes into a second orthogonal code symbol group for statistical multiplexing ~~owing to~~ based on orthogonal code hopping.

37. (Currently Amended) The method of claim 36, further comprising:

performing the code division multiplexing by fixedly allocating ~~the~~ orthogonal code symbols in the first orthogonal code symbol group to a channel having a high data activity ~~in communications~~.

38. (Currently Amended) The method of claim 36, further comprising:

performing an orthogonal code hopping multiplexing for a channel having a low data activity according to an orthogonal code hopping pattern by using only ~~the~~ orthogonal code symbols in the second orthogonal code symbol group.

39. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 36,

wherein ~~the~~ at least one orthogonal code ~~is~~ comprises an orthogonal variable spreading factor code.

40. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 36,

wherein the first orthogonal code symbol group consists of child codes generated from one parent code in a hierarchical orthogonal code generating tree structure according to ~~the~~ variable spreading factors; and

wherein the second orthogonal code symbol group consists of ~~remained~~ remaining orthogonal code symbols.

41. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 36,

wherein the first orthogonal code symbol group ~~used for the code division multiplexing is selected to have~~ comprises a variable spreading gain according to a send data rate.

42. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 40,

wherein the first orthogonal code symbol group ~~used for the code division multiplexing is selected to have~~ comprises a variable spreading gain according to a send data rate.

43. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 36,

wherein the channel for the orthogonal code hopping multiplexing ~~has~~ comprises a fixed data rate,

the method further comprising ~~the step of~~ selecting orthogonal code symbols having the same spreading factor in the second orthogonal code symbol group.

44. (Currently Amended) The method ~~for band spreading communications as claimed in~~ of claim 40,

wherein the channel for the orthogonal code hopping multiplexing ~~has~~ comprises a fixed data rate,

the method further comprising ~~the step of~~ selecting orthogonal code symbols having the same spreading factor in the second orthogonal code symbol group.